issue.[114] We requested comments on whether states should have to adhere to the same planning process as the RPCs.[115] Additionally, we asked whether state licensing would facilitate the construction of regional or statewide systems[116] and whether to permit states to use and share the spectrum with local political subdivisions, as well as Federal and other public safety providers. [117] We also sought comment on the appropriate amount of spectrum to assign to states.[118]

43. Finally, we also invited commenters to suggest other flexible licensing approaches to promote the development of a comprehensively planned public-safety communication system in the 700 MHz band as well as alternative uses of the 8.8 Megahertz that would promote innovative ways to serve the public safety community.[119] We specifically asked commenters to address the Commission's legal authority to adopt alternative licensing approaches.[120] We also sought comment on whether to continue reserving all or part of the reserve spectrum for future technological advances.[121]

44. Commenters generally focused on two issues: (1) state planning "versus" regional planning; and (2) whether states should receive some spectrum for their statewide use. As to the first issue, commenters generally favor using the RPC method for administration of the reserve spectrum.[122] APCO and other commenters assert that state administered spectrum would be an unfunded Federal mandate requiring states to establish a "sub-licensing" program.[123] A few commenters claim that a block of spectrum that is state-administered would not effectively, efficiently or responsively meet the radio communication needs of local public safety service providers.[124] While opposing state administered spectrum, APCO and others recommend that we require RPCs to set-aside a portion of the spectrum for statewide systems.[125] California and Florida recommend that RPCs manage the reserve spectrum but they further recommend that we require RPCs to set-aside a portion of the spectrum for statewide and multi-

[114] *Third Notice* 14 FCC Rcd 232 ¶ 178.

[115] *Third Notice*, 14 FCC Rcd 232 ¶ 178.

[116] *Third Notice* 14 FCC Rcd 232-233 ¶ 178, 179. We asked whether regional or statewide systems would provide the economies of scale and scope that would increase incentives for other public safety providers to participate in the regional or statewide system. *Id.* at 231 ¶ 175.

[117] *Id.* at 232-233 ¶ 179. We noted that, should we decide to license individual states, we would need to revise 47 C.F.R. § 90.179 (Shared use of radio stations) to allow each state licensee to authorize appropriate public safety agencies within the state to use the spectrum pursuant to the state licensee's authorization. *Id.* at 234 ¶ 183. We also proposed to amend 47 C.F.R. § 90.1 to reflect that the scope of Part 90 does not govern the licensing of radio systems belonging to and operated by the United States. *See Third Notice*, 14 FCC Rcd at 234 ¶ 183 *citing* 47 U.S.C. § 305(a).

[118] *Third Notice* 14 FCC Rcd 232 ¶ 178.

[119] *Third Notice*, 14 FCC Rcd 233 ¶ 181.

[120] *Id.* at 234, ¶ 184.

[121] *Third Notice*, 14 FCC Rcd 233 ¶ 181.

[122] *See e.g.*, APCO Comments at 3-4; IACP Comments at 7; Cities Comments at 4.

[123] Arizona Reply Comments at 8; APCO Comments at 3.

[124] Cities Comments at 15; UTC Comments at 7.

[125] APCO Comments at 3; California Comments at 2; IACP Comments at 3.

jurisdictional radio systems.[126] Arizona objects to a state planning, instead of regional planning, approach to spectrum management, and it prefers that the RPC manage the spectrum planning, but it has no objection to the licensing of spectrum directly to the state as a blanket license for its internal use.[127]

45. As to the second issue, many commenters support licensing some spectrum directly to the states.[128] Joint Commenters AASHTO, *et al.*, representing various public safety groups,[129] support licensing each state to administer the 8.8 megahertz of reserve spectrum as delineated in the *Third Notice*.[130] Of the comments received by the states, only California opposes giving states a direct license of at least a portion on the reserve spectrum.[131] Florida, New York, Pennsylvania, Virginia, and Arizona, support direct licensing to the state of at least a portion of the reserve spectrum and see no advantage to management of such state spectrum by the RPCs.[132] New York (*i.e.*, NYSTEC) suggests allocating a portion of the reserve spectrum for statewide use.[133] Pennsylvania strongly urges assigning at least some portion of the reserved spectrum directly to the states. Virginia supports state licensing rather than using RPCs, and it supports state administration of the 8.8 megahertz of reserve spectrum.[134]

46. One commenter, FLEWUG, opposes both RPCs and state-based licensing, and contends that neither process is appropriate or sufficient for licensing the reserve spectrum.[135] It suggests that an expanded NCC becomes the controlling authority for administering and licensing the 8.8 megahertz of reserve spectrum.[136] FLEWUG avers that it is premature to make any further determination as to the use of the reserve spectrum and suggests we defer any decision regarding this spectrum at this time.[137] It

[126] California Comments at 2.

[127] Arizona Reply Comments at 8.

[128] *See e.g.*, NPSTC Comments at 6; Los Angeles Comments at 2; UTC Comments at 2; PSWN Comments at 10.

[129] *See* Joint Commenters AASHTO, *et al.* Comments at 1 (the joint commenters are American Association of State Highway and Transportation Officials (AASHTO), Forestry Conservation Communications Association (FCCA), International Association of Fire Chiefs, Inc. (IAFC), International Association of Fish and Wildlife Agencies (IAFWA), International Municipal Signal Association (IMSA), and National Association of State Foresters (NASF)).

[130] Joint Commenters AASHTO, *et al.* Comments at 3-4.

[131] Tennessee DOT and Wisconsin submitted comments in response to the *Third Notice* but neither addressed the licensing of the 8.8 MHz of reserve spectrum.

[132] Florida Comments at 3; Pennsylvania Comments at 5; Reply Comments at 3, Virginia Comments at 1; Arizona Reply Comments at 8 (Arizona does not object to a state license for its internal use).

[133] NYSTEC Comments at 7. (NYSTEC provides technical assistance to New York State in defining and procuring a next-generation, statewide wireless communications system. NYSTEC Comments at 3.)

[134] Virginia Comments at 1.

[135] FLEWUG Comments at 4.

[136] *Id.*

[137] *Id* at 6.

recommends we refer this matter, *i.e.*, the use of the reserve spectrum, to the NCC for further examination.[138]

47. Upon review of the extensive record in this proceeding and based on the Commission's considerable experience in licensing public safety entities, we believe a two-fold approach is best for the 7.8 megahertz of reserve spectrum.[139] We conclude that the 700 MHz plan should be augmented by designating the narrowband segment (2.4 megahertz, or ten percent of the spectrum) as an optional geographic state license, while holding the wideband segment (5.4 megahertz, or twenty-two percent of the spectrum) in reserve for future expansion.[140] We believe this decision complements the current 700 MHz plan, whereby RPCs administer 12.5 megahertz, or fifty-two percent of the spectrum – 7.7 megahertz for narrowband operations (voice and data) and 4.8 megahertz for wideband technologies (image/HSD and slow motion video). This decision responds to the majority view that a certain portion of the spectrum needs to be set-aside for statewide systems, either licensed directly to the states or administered through the RPCs.[141] We further believe, for the public safety radio service where market incentives do not apply, that it is prudent to hold some spectrum in reserve to accommodate future requirements that are unforeseen at this time. This decision is in line with those parties, which filed either Petitions for Reconsideration to the *First Report and Order* or comments to the *Third Notice*, that suggest that our 700 MHz plan either lacks flexibility or needs further study.[142]

1. State License

48. As discussed above, we conclude that each state should have an option to receive a statewide license for up to 2.4 megahertz of 700 MHz band public safety spectrum. The Commission has long encouraged public safety agencies to develop wide-area multi-agency trunked public safety radio systems and the 700 MHz band public safety allocation offers a unique opportunity to facilitate the development of these systems.[143] Under this approach, states will have limitless possibilities to apply their unique expertise and knowledge to best use the radio spectrum to meet the public safety needs of their citizens. Specifically, state licensees will have significant flexibility in terms of the technologies, programs/systems to deploy — so long as the spectrum is used for public safety services as required by Section 337 of the Communications Act.

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[138] *Id.*

[139] As decided in the *First Report and Order* and modified by the *Third MO&O*, the composite band plan provides 7.8 megahertz of reserve spectrum split as follows — 2.4 megahertz for narrowband operations (voice and data) and 5.4 megahertz for wideband technologies (image/HSD and slow motion video).

[140] The 7.8 megahertz of reserve spectrum subject to current consideration is split between narrowband and wideband segments – 2.4 megahertz narrowband and 5.4 megahertz wideband.

[141] Joint Commenters AASHTO, *et al.*, Arizona, Florida, Pennsylvania, Virginia, and NYSTEC supported either all or a portion of the reserve spectrum be designated for direct state licenses. While opposing the state licensing, APCO, IACP, NPSTC, and California recommended that RPCs be required to set-aside a portion of the reserve spectrum for statewide or wide-area systems. *See,* Joint Commenters AASHTO, et al. Comments at 1. Arizona Reply Comments at 8. Florida Comments at 3. Pennsylvania Comments at 5 and Reply Comments at 3. Virginia Comments at 1. NYSTEC Comments at 7. APCO Comments at 6. IACP Comments at 3. NPSTC Comments at 6. California Comments at 2.

[142] APCO Petition at 15, 16. Powell Petition at 5. NPSTC Petition at 4. (discussed above in the *Third MO&O* at paragraphs 17, 23, and 32.) FLEWUG Comments at 6.

[143] *See, e.g., Third Notice*, 14 FCC Rcd at 230-31 ¶¶ 174-75.

49. Licensing up to 2.4 megahertz of the reserve spectrum to each state is consistent with a majority of the commenters — those supporting state licensing for either all or a portion of the spectrum as well as those parties requesting that RPCs set aside spectrum for state-wide use.[144] The PSWAC Transition Subcommittee (TRSC)[145] also reported solid support for state wide and area wide system licensing and operation — so long as such licenses are for state operations and based on state and local governments having joint planning, ownership, and operation of such systems.[146] TRSC described a sampling of these systems then under development by the States of Colorado, Michigan, Louisiana, and Iowa and surrounding states.[147] TRSC emphasized that "[i]t is important not to confuse state licenses for [state agency] operations [with state licenses] for operations with other than state agencies on a shared basis."[148] Specifically, TRSC contrasted the solid support for state wide and area wide system licensing with any block license approach that would create spectrum management roles for states. TRSC averred that the state planning approach would raise complex issues including: (1) whether states want to be spectrum managers; and (2) the extent to which such a role would affect the "balance of power" between the state and local governments within their boundaries.[149] Accordingly, we conclude that states with bold visions for expansive statewide/regional coverage should have the option to receive a direct State License as a new tool for addressing their communication requirements.

50. State License complements the RPC process. The State License approach complements the RPC process by ensuring that each state receives a significant amount of spectrum for statewide use, because the RPC process, by definition, may not focus on the statewide needs of every state.[150] In this regard, we note that several commenters want the FCC to make significant changes to the process to correct alleged deficiencies (in the RPC process adopted in the *First R&O*),[151] or assume oversight of RPCs.[152] California notes that because wide-area systems reduce the availability of not only the channels assigned to the system but also the adjacent channels which might present interference situations, states are at a distinct disadvantage in arguing within the regional planning structure for spectrum.[153] PSWN notes that states, due to their status as the largest users of spectrum, may find it difficult to objectively

[144] APCO Comments at 3-6; APCO Reply Comments at 3; Florida Comments at 3; Pennsylvania Comments at 5; Pennsylvania Reply Comments at 5; Virginia Comments at 1; Joint Commenters AASHTO, *et al.* Comments at 1; NYSTEC Comments at 22-23; Arizona Reply Comments at 8; California Comments at 5-7.

[145] The Transition Subcommittee examined and proposed procedures for public safety agencies to transition to new technologies and new spectrum in an efficient, cost effective manner that does not interfere with their critical operations. *PSWAC Final Report* at 726 (Transition Subcommittee Report § 1.0).

[146] *PSWAC Final Report* at 754 (Transition Subcommittee Report §§ 7.2.12-13). "The Transition Subcommittee supports such planning and priority licensing for shared state or area systems." *Id.* at 754 (§ 7.1.13).

[147] *PSWAC Final Report* at 751-53 (Transition Subcommittee Report at § 7.2.8). TRSC observed that the state is the largest spectrum user in most instances. *Id.* at 755 (Transition Subcommittee Report § 7.2.14). TRSC noted that the system in Iowa, and surrounding states, is Racom's commercial wireless, trunked digital system that offers law enforcement customers "ruthless preemption" over business customers. *Id.*

[148] *Id.* at 754 (§ 7.1.13.).

[149] *Id.* at 755 (§ 7.2.14).

[150] *Third Notice*, 14 FCC Rcd 231 ¶ 176.

[151] PSWN Comments at 7-8; Region 20 Comments at 4; Cities Comments at 10-13.

[152] PSWN Comments at 7-8; API Comments at 7-8.

[153] California Comments at 5.

weigh its spectrum needs against those of local governments, counties and cities.[154] PSWAC noted that while the regional planning for the 800 MHz band has been reasonably successful overall, the process may have frustrated state government's inherent interest in planning public safety communication solutions on a statewide basis by fragmenting the management of the 800 MHz RPC spectrum.[155]

51. Although some commenters favor an approach whereby the RPCs set-aside spectrum for statewide or regional systems, we believe it would be administratively burdensome, complicate coordination, and possibly increase the potential for interference. While favoring the RPC process, California asks us to require RPCs to assign channels for state use only pursuant to a specific channelization pattern.[156] Florida sees no advantages to RPC management of any portion of the spectrum that we might allocate for statewide use.[157] We agree with these views and find that a uniform channel plan facilitates the development of state systems whereas allowing each of the fifty-five RPCs to adopt irregular channel plans would complicate the inter-regional coordination and increase the potential for interference. We disagree with APCO's assertion that RPCs should have the responsibility to designate which frequencies to set-aside in consultation with RPCs from neighboring regions to maximize re-use of the spectrum.[158] Co-channel and adjacent channel assignments need to be judiciously spaced (*i.e.,* frequency re-use) to avoid interference regardless of whether the assignments are used by neighboring states or other public safety entities (*e.g.,* city or county governments). In fact, we believe designating consistent frequencies to states would promote frequency re-use because each state would have a vested interest in designing optimal frequency plans for both parties. It also simplifies border-area coordination to a state-to-state discussion rather than multiple state-to-regional, *i.e.,* numerous counties and other local jurisdictions, discussions. Consequently, we will designate certain spectrum for State Licenses rather than requiring RPCs to set-aside spectrum.

52. State License – 2.4 megahertz of spectrum. We conclude that designating 2.4 megahertz for state licensing is in line with the spectrum needs identified by those commenters who suggested designating specific amounts of spectrum for state use. While the commenters sought amounts ranging from APCO's suggestion of 1.25-2.0 megahertz as the minimum for the RPCs to set-aside[159] to Joint Commenters AASHTO, *et al.* and Virginia's request for all 8.8 megahertz of the reserve spectrum, most commenters sought between 2.5 to 3.75 megahertz of spectrum. NYSTEC suggests *at least* 2.5 megahertz of spectrum should be designated for statewide systems.[160] California requests 2.8 megahertz

[154] PSWN Comments at 10 *citing PSWAC Final Report* at 755 (Transition Subcommittee Report § 7.2.14).

[155] *PSWAC Final Report* at 315.

[156] California Comments at 5. "The State requests that the Commission assign [2]00 [6.25 kHz] channel pairs (2.5 MHz of spectrum) for state use only. The State further requests that these . . . channel[s] be spread across the entire band, grouped in into at least 20 sets of adjacent channels with at least 200 kHz separation between each set." *Id.* California separately noted that the "failure of just one [RPC] to provide appropriate channel assignments can destroy the state's ability to meet its communication need." *Id.* at 4.

[157] Florida Comments at 3.

[158] APCO Comments at 6.

[159] APCO initially suggested requiring RPCs to set aside a *minimum* of 1.25 MHz for state-wide use, but later noted support for a minimum of 2 MHz for state-wide use. APCO Comments at 6. (*Emphasis in original.*) APCO Reply Comments at 3.

[160] NYSTEC Comments at 23.

of spectrum for state systems and another 3.1 for multi-jurisdictional radio systems.[161] Florida requests 3.75 megahertz of spectrum.[162] Arizona has no objection to licensing all 8.8 megahertz of the reserve spectrum to the State, as a blanket license for its internal use.[163] Based on the comments, we believe 2.4 megahertz strikes the right balance between providing states sufficient spectrum to fully explore and implement state-wide public safety systems and providing states with an amount of spectrum that would either lie fallow or be used in an inefficient manner.[164]

53. While we acknowledge that each state has varying communications requirements, our decision to designate 2.4 megahertz of spectrum is consistent with the record before us. Adopting the same amount of spectrum for all states, regardless of size, is reasonable because the needs of smaller states for frequencies to satisfy communications requirements of high-density population areas will be similar to needs of larger states to cover fewer urban centers spaced over expansive geographic areas. Moreover, as discussed above, designating consistent spectrum for state use offers distinct benefits such as improved coordination. Consequently, we will adopt the same 2.4 megahertz of spectrum for all states.[165] As noted above, we are providing states the same 2.4 megahertz of spectrum nationwide to "open the door" for states to consider cooperative arrangements with their neighbors for new, reliable 700 MHz band radio networks to address interstate public safety concerns such as natural disasters, forest fires, search and rescue missions, and highway emergencies or maintenance. Designating the same 2.4 megahertz of spectrum nationwide provides additional opportunity for the development of interoperability capabilities as well as the potential acceleration of the introduction of new equipment designed to take advantage of this spectrum.[166] Designating the same 2.4 megahertz should also improve interstate frequency coordination, thereby decreasing the potential for interference at state borders.

54. State License is a geographical area license. For commercial mobile radio services, the Commission has concluded that licensing based on pre-defined service areas poses significant advantages, over site-based licensing, because of the greater operational flexibility it affords licensees, its inherent

[161] California requests 2.5 MHz (200 pairs of 6.25 kHz channels) for narrowband operations and 0.3 MHz wideband for state systems. California Comments at 6. California also noted that 8.8 MHz of spectrum is too large an amount for state internal use. California Comments at 3.

[162] Florida requests 2.5 MHz (200 pairs of 6.25 kHz channels) for narrowband operations and 1.25 MHz for wideband. Florida Comments at 4.

[163] Arizona Reply Comments at 8. Arizona adds "[i]f the 8.8 megahertz of spectrum is licensed to the State directly for their own use only, then there is no reason for them to share in the general pool of frequencies." *Id.*

[164] We acknowledge that by designating 2.4 megahertz for state use, we are providing states with almost the same amount of spectrum that we allocated for nationwide interoperability. However, we believe this designation reflects the states need of spectrum for daily, routine use over a specific area, usually employing trunked infrastructure, while interoperability is almost exclusively used on a unit-to-unit, mutual aid basis in response to a concentrated, geographically-based incident.

[165] We feel that 2.4 MHz should be more than enough spectrum to ameliorate this potential problem in most states. We note that, in the event that 2.4 MHz proves to be an insufficient amount of bandwidth, states can seek additional spectrum from RPCs or pursue joint ventures with local governments to implement state/regional systems.

[166] We anticipate these developments could provide economies of scale and other benefits to state agencies and other government public safety agencies within the state. These developments also provide opportunities for less affluent localities to take advantage of the latest public safety technology by designing their systems around the use of the state-wide spectrum.

ability to simplify system expansion, and its easing of the administrative burden on the Commission.[167] While APCO states that statewide systems are not incompatible with regional planning and cites that numerous statewide systems have been approved within the 800 MHz band, we believe a geographic license offers some distinct advantages.[168] PSWAC noted that the implementation of wide-area systems by the public safety community has been hindered, in part, by the Commission's site-by-site licensing process for public safety radio.[169] Frequency-by-frequency, site-by-site, planning is a costly and time-consuming process for states that are seeking to assemble spectrum building blocks at the local level and aggregate into a statewide structure.

55. We conclude that a geographical license for states is a logical outgrowth of the RPC process and we believe it would provide a valid approach to the varying communications needs of all sectors of the public safety community – federal, state, and local.[170] Generally, when spectrum is used for private internal services, including public safety, it is not necessary to develop geographic area licensing [to ensure that service is widely available to the general public].[171] However, site-by-site licensing is designed primarily to license dispatch radio systems on a transmitter-by-transmitter basis in local areas [markets] and the Commission has recognized that this licensing process is very cumbersome for radio systems comprised of several hundred sites.[172] It also deprives licensees that need to cover a wide geographic area of flexibility to move transmitter sites throughout a defined service area without obtaining our prior approval.[173]

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[167] *See, e.g.*, Implementation of Sections 3(n) and 332 of the Communications Act, Regulatory Treatment of Mobile Services, Amendment of Part 90 of the Commission's Rules to Facilitate Future Development of SMR Systems in the 800 MHz Frequency Band, Amendment of Parts 2 and 90 of the Commission's Rules to Provide for the Use of 200 Channels Outside the Designated Filing Areas in the 896-901 MHz and 935-940 MHz Band Allotted to the Specialized Mobile Radio Pool, PR Docket Nos. 89-553, 93-144, GN Docket No. 93- 252, *Third Report and Order*, 9 FCC Rcd 7988, 8044 (1994).

[168] APCO Comments at 5. (APCO cites the statewide systems of Minnesota, Ohio, Florida, Colorado, Connecticut, California, and Michigan. *Id.*)

[169] *PSWAC Final Report* at 315. PSWAC also noted a reticence of individual agencies to surrender some autonomy in return for the efficiencies and better coverage of the larger system. *PSWAC Final Report* at 317-318. We note, however, that PSWAC contends that in many instances perceived losses in terms of independence of operation are more than offset by improvements in function and efficiency. *PSWAC Final Report* at 3.

[170] On a related point regarding administration of interoperability spectrum, Florida, Pennsylvania, FLEWUG, and PSWN, indicate that state communication systems are the most appropriate "bridge" between local and Federal government agencies. *See,* Florida Comments at 5, Pennsylvania Reply Comments at 3; FLEWUG Comments at 17-18; and PSWN Comments at 15.

[171] We recently decided that a site-by-site licensing scheme with frequency coordination is the best approach to licensing the 928/952/956 MHz bands (Multiple Address Systems) because we reserved these bands for private internal use. *See* Amendment of the Commission's Rules Regarding Multiple Address Systems, WT Docket No. 97-81, *Report and Order*, FCC 99-415 at ¶ 45 (rel. January 19, 2000).

[172] *See* Amendment of Part 90 of the Commission's Rules to Facilitate the Future Development of SMR Systems in the 800 MHz Frequency Band, PR Docket No. 93-144, Implementation of Sections 3(n) and 322 of the Communications Act – Regulatory Treatment of Mobile Services, GN Docket No. 93-252, Implementation of Section 309(j) of the Communications Act – Competitive Bidding, PP Docket No. 93-253, *Second Report and Order*, 12 FCC Rcd 19,079 (1997).

[173] *Id.*

56. In determining what type of geographic area license is most appropriate for particular wireless services, we have considered such factors as the nature of the service (*e.g.*, technological constraints), the presence of natural markets, cost of build-out, and the range of services that can be offered in the most rapid and efficient manner. This determination has led to the use of a variety of different license areas (*e.g.*, Metropolitan Statistical Areas, Economic Areas). In this case, the geopolitical boundaries of each state form an appropriate and convenient geographical licensing area for public safety radio spectrum. Noting that spectrum propagation does not honor state boundaries, APCO cites the northeast where regions are organized around multi-state metropolitan areas as a drawback to state licensing.[174] We reject this argument, because, as Pennsylvania points out, radio signals do not respect the artificial boundaries of the RPCs.[175] Indeed, the northeast, where RPCs are metropolitan based rather than state-based, have provided some of our most complicated and vexing problems to be solved. Consequently, we conclude that an optional state-based geographic license is desirable and offers some distinct advantages over RPCs for managing spectrum designated for state operations.

57. State License promotes efficient spectrum use and allows economies of scale. Experience with geographic area licensing in the commercial wireless sector demonstrates that geographic area licenses often encourage the rapid development and deployment of innovative service, facilitate interoperability and operational standards while allowing economies of scale that encourage the development of low cost equipment.[176] APCO contends that, although a few large states may well have the capability to administer the reserve spectrum, most state governments are ill-equipped and unwilling to manage radio spectrum, nor are they able to fund such activities in most cases.[177] Pennsylvania disagrees and notes that the states have the technical and policy expertise to construct wide-area systems and to manage the use of spectrum licensed to the state.[178] We concur, and cite the many state systems currently being built or planned as evidence of the expertise and resources being expended by the states.[179] We believe that providing each state with up to 2.4 megahertz of spectrum will give each state greater latitude to implement spectrum saving technologies in public safety communications by allowing states to plan and develop shared, wide-area systems under a substantially streamlined FCC licensing process.[180] We further note that shared, wide-area systems, *i.e.*, large trunked systems, can provide service to many governmental entities in a given geographical area, which provides greater spectrum efficiency than systems incorporating many smaller non-trunked systems or systems trunked on fewer channels.[181]

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[174] APCO Comments at 4.

[175] Pennsylvania Comments at 4.

[176] *See, e.g.*, Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service, GN Docket No. 96-228, *Report and Order*, 12 FCC Rcd 10785, 10814 (1997).

[177] APCO Comments at 3.

[178] Pennsylvania Reply Comments at 2.

[179] *E.g.*, California, Delaware, Florida, Louisiana, Michigan, Missouri, Montana, New Hampshire, Pennsylvania, South Carolina, Virginia, and Utah. *See Third Notice*, 14 FCC Rcd at 232 ¶ 178; *see also* text accompanying note 147, *supra*.

[180] One of the goals identified in the *Second Notice* was the promotion of efficient and effective use of the new spectrum, and, one of the keys to efficient spectrum use is accommodating local, state, and regional needs. *Second Notice*, 12 FCC Rcd at 17,711 and 17,715.

[181] *PSWAC Final Report* at 317-318. Shared systems also offer a high level of built-in interoperability. *Id.*

58. We also believe that our decision may give state public safety agencies greater access to cutting-edge technology that will not only allow them to achieve greater efficiencies in the performance of their duties, but also will reduce danger to public safety personnel.[182] As noted in the *Third Notice*, the development of state-wide systems that include state agencies of various sizes may allow states to more easily deploy state-of-the art systems, due to the economics of scale and scope. Pennsylvania further notes that these wide-area, state systems can provide economies of scale and other benefits to state agencies and local public-safety agencies within the state.[183] States deploying such systems decrease the cost that any one agency needs to bear for infrastructure and lowers the per-user cost for the whole system.[184] Thus, a statewide system could serve as the backbone for delivering new technologies in a cost-effective way to localities throughout the state. Rather than bypassing local communications needs, the statewide system is a way to ensure that jurisdictions in the state are not divided into communications "haves" and "have-nots."

59. The State License approach that we are adopting is also in line with PSWAC's recommendations to (1) encourage more sharing and joint use of spectrum resources in light of the considerable success some states and regions are experiencing in pooling spectral resources, and (2) consider block allocations for public safety use and adopt flexible licensing policies that encourage the use of the most spectrally-efficient technology to meet user defined needs.[185]

a. Licensing and Operational Requirements

60. Based on the channel plan and other decisions set forth above, we will allow any state[186] that chooses to take advantage of spectrum that we have designated for state use to file an application for up to 2.4 megahertz of this spectrum no later than December 31, 2001.[187] We believe that providing states this amount of time to apply for this spectrum allows every state at least one legislative cycle or fiscal year to allocate the funds necessary to plan, prepare, and implement the use of the spectrum.[188] What ever part of this 2.4 megahertz that a state has not applied for by December 31, 2001, will revert to General Use and be administered by the relevant RPC (or RPCs in the instances of states that encompass multiple RPCs).

61. Upon receipt and processing of a state's application, we will issue a license directly to the governor of each state, or its designee.[189] The Communications Act imposes no time limit on licenses issued by the Commission, other than those for broadcast services, which are limited to an eight-year

[182] *See, e.g., PSWAC Final Report* at 2.

[183] Pennsylvania Comments at 5, *see also* NYSTEC Comments at 22-23; PSWN Reply Comments at 8.

[184] *Third Notice*, 14 FCC Rcd 231 ¶ 176.

[185] *See PSWAC Final Report* at 2-4, 19 (Key Finding 2.1.7), 22-23 (Key Recommendation 2.2.3).

[186] We are adopting a definition of "state" that includes United States territories and possessions. *See* 47 C.F.R. § 90.7, as amended (Appendix F).

[187] States will use FCC Form 601 for this application.

[188] We also believe that by allowing each state to elect whether to take the designated spectrum, we address Arizona and APCO concerns and avoid imposing an unfunded mandate on those states that do not wish to utilize the spectrum. Similarly, we believe that allowing states to apply for less than the full 2.4 megahertz of spectrum that will also avoid imposing an unfunded mandate and help to ensure the efficient utilization of this spectrum.

[189] *Accord, e.g.*, Florida Comments at 8 (Florida recommends that the Governor's office of each state be responsible and accountable for development and construction of a state use plan); Virginia Comments at 1.

license term.[190] Section 90.149 of our Rules[191] provides for ten–year license terms in the Private Land Mobile Radio Services.[192] In the context of 700 MHz band geographic–area licenses, we are concerned that the continued existence of incumbent broadcasters in the state license spectrum may retard a licensee's development and use of the spectrum.[193] Thus, we are modifying the license term for the state license to accommodate licensees' need for additional time to develop and use this spectrum, in light of its continued use by broadcasters until 2006 at the earliest. Subject to the conditions set forth below, the initial license term for these licenses will be fifteen years.[194] States can subsequently renew these licenses for additional ten-year periods. Renewal will not be automatic, but state licensees will have a renewal expectancy subject to the conditions set forth below.

62. *Conditions of Grant* We believe it is necessary to establish construction and operation requirements to ensure efficient use of the spectrum including the provision of service to rural, remote, and insular areas. We believe setting our initial construction/operation benchmark at five years is consistent with our experience and Rules for public safety/government entities.[195] Because incumbent broadcasters are not required to complete relocation to other portions of the spectrum until December 31, 2006, we will calculate the five–year benchmark using January 1, 2007 as the starting date.[196]

63. Accordingly, each state license will be granted subject to the condition that the state certifies on or before each applicable benchmark date (see below) that it is:

- providing or prepared to provide "substantial service"[197] to one-third of their population or territory[198] by January 1, 2012, *i.e.*, within five years of the date that incumbent broadcasters are required to relocate to other portions of the spectrum;"

[190] *See* 47 C.F.R. § 73.1020(a).

[191] *See* 47 C.F.R. § 90.149(a) (2000).

[192] *See* 1998 Biennial Regulatory Review -- 47 C.F.R. Part 90 - Private Land Mobile Radio Services, WT Docket No. 98-182, Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignment Policies of the Private Land Mobile Services, PR Docket No. 92-235, *Report and Order and Further Notice of Proposed Rulemaking*, FCC 00-235 at ¶¶ 9-10 (rel. July 12, 2000) (*Part 90 Biennial R&O*).

[193] *See* Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, WT Docket 99-168, *First Report and Order*, 15 FCC Rcd 476, 504 ¶ 67 (2000) (*Commercial 700 MHz R&O*).

[194] We adopted fourteen year license term for geographic area licensees in the commercial 700 MHz band. *See id.* As discussed immediately below, however, the "substantial service" deadline for state licensees will be January 1, 2017. We envision granting state licenses early in the year 2002, thus necessitating a fifteen year license term.

[195] *See* 47 C.F.R. §§ 90.155(b), 90.629(b).

[196] We may defer this date (and thus extend the deadlines) if the DTV transition period for a relevant market is extended as set forth in 47 U.S.C. § 309(j)(14)(B) (*e.g.*, markets where 15% or more households do not have access to either DTV-equipped receivers or multi-channel video). In addition, given the large geographic licensing areas, each with a number of incumbent broadcasters, we are setting a definite license term, rather than one dependent on the date on which incumbent broadcasters complete their digital television transition. *See Commercial 700 MHz R&O*, 15 FCC Rcd at 504 ¶ 67.

[197] The term "substantial service" – a term more commonly used in a commercial wireless context – is used for convenience herein to refer to the construction and operation of 700 MHz facilities by public safety entities providing "service which is sound, favorable, and substantially above a level of mediocre service which just might

- providing or prepared to provide "substantial service" to two-thirds of their population or territory by January 1, 2017, *i.e.*, within ten years of the date that incumbent broadcasters are required to relocate to other portions of the spectrum.

- We will deem a state "prepared to provide substantial service" if the licensee certifies that radio system has been approved and funded for implementation by the deadline date.

- If a licensee fails to meet any condition of the grant the license is modified automatically to the frequencies and geographic areas where the state certifies that it is providing substantial service.

  - Any recovered spectrum will revert to General Use. [199]

  - We clarify, however, that spectrum licensed to a state under a state license remains unavailable for reassignment to other applicants until the Commission's database reflects the parameters of the modified state license.

64. We conclude that these construction and operation requirements constitute effective safeguards and performance requirements for the efficient use of this spectrum. However, we reserve the right to review these requirements in the future if we determine that a reassessment is warranted to ensure that the radio spectrum is used efficiently.

65. *Conforming Amendment to Section 90.179* Under Section 90.179[200] of our Rules, a licensee may share its system with other entities that are eligible to hold a license for the same spectrum.[201] A station is shared when persons not licensed for the station control it for their own purposes pursuant to the licensee's permission.[202] In the *Third Notice*, we noted that if we decided to license individual states, we would need to revise Section 90.179 to allow state licensees to authorize appropriate public safety agencies within the state and its political subdivisions to use the spectrum for their own purposes pursuant to the state licensee's authorization.

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minimally warrant renewal." *See* Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service ("WCS"), GN Docket No. 96-228, *Report and Order*, 12 FCC Rcd 10843-45 ¶¶ 111-115 (*Part 27 Report and Order*).

[198] We allow states to certify that they are providing substantial service to its population because we recognize that state public safety entities have a responsibility to protect the safety of life, health and property. We allow states to certify that they are providing substantial service to its territory because we recognize that state public safety entities have responsibilities statewide — both densely populated areas and lesser populated rural areas.

[199] *Accord* Joint Commenters AASHTO, *et al.* Comments at 3-4 (spectrum should be maintained for a period of five years following the full availability of the spectrum and then default to the RPCs).

[200] 47 C.F.R. § 90.179.

[201] We recently amended 47 C.F.R. § 90.179 to allow on a non-profit, cost-shared basis: (1) Public Safety Pool licensees to share their facilities with Federal Government entities, and (2) Industrial/Business Pool licensees to share their facilities with Public Safety Pool eligibles. *See Part 90 Biennial R&O*, 15 FCC Rcd __¶¶ 19-21 (2000).

[202] 47 C.F.R. § 90.179(a).

66. The state, as licensee, will be responsible for assuring that the authorized facility is used only by persons and for purposes consistent with Section 90.179.[203] For example, if the state, as licensee, shares a land station on a non-profit, cost sharing basis, it must do so pursuant to a written agreement between the state and each participant that is kept as part of the station records.[204] This amendment is necessary to provide state licensees with the same operational flexibility that Section 90.179 now provides all other PLMR licensees. By comparison, we decline to adopt a "State Licensing" approach under which states – rather than regional planning committees (RPCs) – would manage state, local, and Federal use of all or most of the 8.8 megahertz of reserve spectrum.

b. Technical Requirements

67. State applicants and licensee will be subject to the general limits that govern geographic area licenses including antenna structures and air navigation, international coordination, environmental requirements, and quiet zones.[205] In addition, we will mirror our decision in the *Commercial 700 MHz R&O* and adopt a field strength[206] of 40 dBu/m[207] to control harmful interference between state systems in the 746-764 MHz and 776-794 MHz bands. As we stated in that decision, we believe the field strength approach provides established, objective criteria for controlling in-band interference, and gives licensees the ability to construct and operate facilities in boundary areas so long as the limit is met.[208] We further believe that use of the field strength procedure will satisfy the requirement in Section 337(d)(1) that the Commission establish "interference limits at the boundaries of the spectrum block and service area."[209] Similarly to our decision in the *Commercial 700 MHz R&O*, we will permit adjoining states to agree to alternate field strengths at their common border.[210]

2. 700 MHz Band Reserve

68. We are reserving the remaining 5.4 megahertz of wideband spectrum for future (mid–term) needs and future developments in broadband technologies. We recognize that there was opposition to our retaining any of the public safety 700 MHz band as reserve spectrum. We believe, however, that whenever a large amount of spectrum[211] is made available in a new band for public safety, it is good

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[203] 47 C.F.R. § 90.179(b). As with current Section 90.179, the shared use of the spectrum licensed to the individual states would be predicated on the authorized user and the state complying with all the provisions of Section 90.179.

[204] *See* 47 C.F.R. § 90.179(d).

[205] *See, e.g., Commercial 700 MHz R&O*, 15 FCC Rcd at 514 ¶ 93. *See also* 47 C.F.R. §§ 27.51, 27.54, 27.56, 27.57, 27.59, 27.61, 27.63; *see also Part 27 Report and Order*, 12 FCC Rcd at 10848-65 ¶¶ 123-161.

[206] The "field strength" approach requires a licensee to limit the field strength of its station transmissions to some prescribed level at the licensee's geographic border.

[207] The predicted 40 dBu/v field strength shall be calculated using Figure 10 of Section 73.699 of this chapter, with a correction factor for antenna height differential of –9 dB. 47 C.F.R. § 73.699, Fig. 10.

[208] *Commercial 700 MHz R&O,* 15 FCC Rcd at 515 ¶ 96-97.

[209] 47 U.S.C. § 337(d)(1).

[210] *Commercial 700 MHz R&O,* 15 FCC Rcd at 515 ¶ 97.

[211] With 1920 narrowband channels available, we do not think public safety entities will be adversely impacted in the short term if the Commission retains some reserve spectrum.

spectrum management policy to keep some spectrum in reserve for unforeseen needs.[212] In this case, public safety regional plans for the 700 MHz band have not been finalized and, in most cases, not even started. As discussed earlier, some parties asked for further study — NPSTC's Petition for Reconsideration requested locating a "reserve band" between the narrowband and wideband channels to accommodate future needs;[213] Powell's Petition for Reconsideration also requested that we defer the planning of the wideband channels until further discussions could commence on the development of a national HSD network;[214] and FLEWUG requests that all 8.8 megahertz be held in reserve pending further consideration by the NCC.[215] Thus, we conclude that holding some wideband spectrum in reserve is a prudent course of action at this time. Keeping a relatively small reserve (twenty-two percent of the 700 MHz band) gives the Commission flexibility to "fine tune" the band plan in the future with the benefit of experience that can only be gained after radio systems are deployed in this new band.

69. Specifically, in the *Third MO&O*, we regrouped the reserve spectrum into four (2 pair) segments of 1.35 megahertz each that are located between the narrowband and wideband segments.[216] This regrouping offers improved flexibility to accommodate future requirements that are unforeseen at this time because the 5.4 megahertz of reserve spectrum is located between narrowband and wideband segments so we can accommodate future needs for narrowband, wideband or broadband that may be identified through the planning process or by advances in technology without impacting existing plans or licensees. Keeping a reserve that is grouped in two pairs of 1.35 megahertz each also recognizes trends towards broadband technologies. For example, the 108 wideband channels that we are reserving could accommodate needs such as exclusive high speed data,[217] additional interoperability spectrum,[218] or hybrid commercial/private mobile system.[219] Therefore, we will retain 5.4 megahertz of spectrum as a public safety reserve. Once the 700 MHz band planning process is complete, we will review the status of a spectrum reserve. Also, we would welcome any future suggestions the NCC may have regarding this issue.

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[212] For example, when deciding on how to allocate the 40 megahertz of 800 MHz PLMR spectrum, the Commission decided to make 30 megahertz available and keep 10 megahertz in reserve for unforeseen needs. *See* An Inquiry Relative to the Future Use of the Frequency Band 806-960 MHz; Amendment of Parts 2, 18, 21, 73, 74, 89, 91, and 93 of the Rules Relative to Operations in the Land Mobile Service Between 806 and 960 MHz, Docket No. 18262, *Second Report and Order*, 46 FCC 2d 752, 759 ¶ 19 (1974). Later, when the Commission made the 10 megahertz of reserve spectrum available, the Commission changed the operating and licensing parameters due to changing needs.

[213] *See* NPSTC Petition at 4; *see also* para. 33, *supra.*

[214] *See* Powell Petition at 5; *see also* para. 24, *supra.*

[215] *See* FLEWUG Comments at 4; *see also* para. 46, *supra.*

[216] *See* paras. 33-34, *supra.*

[217] IACP Comments at 3.

[218] API Comments at 8.

[219] FLEWUG Reply Comments at 8.

B. Protection of the GNSS[220] from Second Harmonic Interference

70. In the *Third Notice*, we proposed technical solutions to protect the GNSS global navigation satellite systems, particularly the GLONASS.[221] We were concerned that second harmonic emissions[222] from public safety mobiles operating in the 794-806 MHz band (TV channels 68 and 69) may cause harmful interference to aeronautical users of GLONASS receivers.[223] To protect this system and to ensure that equipment operating in these bands would not cause radio interference to the GNSS, NTIA advocated applying out-of-band emission limits for GNSS to all spurious emissions, including second harmonic emissions, and being limited to: (1) wideband emissions, -70 dBW/MHz equivalent isotropically radiated power (EIRP); and (2) narrowband emissions, -80 dBW/700 Hz. We proposed to apply the emission limits requested by NTIA only to the second harmonics to the GLONASS band. However, we requested comment concerning the validity of the assumptions that underlie NTIA's requested standard, such as the assumed separation distance of 30 meters between public safety mobile operations and GLONASS receivers.[224] In addition, we sought comment on the impact of these proposed limits on the design of equipment for public safety use in the 700 MHz band.[225] We further noted that NTIA's standard is only necessary to protect GNSS operations in the 1559-1605 MHz band.[226] Therefore, we proposed to apply the traditional FCC standard (*i.e.*, generally 43 + 10 log P) outside the radionavigation satellite service (RNSS) frequency band.[227]

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[220] The GNSS has two components, GPS and GLONASS, and provides radionavigation satellite services (RNSS) worldwide. The GPS is in operation and will be the United States component of the GNSS. GPS utilizes the lower portion of the RNSS (space-to-Earth) allocation from 1559-1610 MHz on a primary basis, and is maintained by the United States Department of Defense. GLONASS, the other component of the GNSS, is the Russian Federation Global Orbiting Navigation Satellite System, which will use the 1597-1605 MHz portion of that allocation (*i.e.*, the second harmonic frequencies of TV channels 68 and 69) when the system reaches its final frequency configuration after 2005. We recently addressed the potential of second harmonic emissions in the 776-794 MHz band (TV Channels 65-67) to GPS. *See Commercial 700 MHz R&O,* 15 FCC Rcd at 524 ¶ 116.

[221] *Third Notice,* 14 FCC Rcd at 241 ¶ 196.

[222] Radio transmitters produce energy not only on the desired frequency but also lesser amounts of energy on multiples of the desired frequency, known as harmonics. Although most of the power generated is on the desired frequency, very sensitive receivers can detect the smaller amounts of power generated on the harmonic frequencies.

[223] *Third Notice*, 14 FCC Rcd at 241, ¶ 196.

[224] *Id.* at 243 ¶ 199.

[225] *Id.* at 243, ¶ 199, n.533.

[226] Although some commenters raised similar concerns regarding second harmonic interference from public safety operations in the 772-772.5 MHz band to ground stations (known as Local User Terminals, LUTs) in the 1544-1545 MHz band of the COSPAS-SARSAT satellite system for search and rescue emergency radio beacons of the Global Maritime Distress and Safety System (GMDSS), this matter will not be considered at this time because the affected public safety frequencies are located in the wideband reserve spectrum (Channels 103-108). *See* NTIA Comments at 16-17, and NOAA/USCG Reply Comments at 2.

[227] *Id.* at 243, ¶ 199.

1. Base/mobile Pairing ("Band Flipping")

71. In the *First Report and Order*, we noted that manufacturers could design future public safety equipment to operate in both the 700 MHz and 800 MHz bands.[228] In that context, we decided to designate the higher 794-806 MHz band for mobile-to-base communications, due in part to its proximity to the adjacent 806-824 MHz band that is designated for mobiles and/or portables as well.[229] FLEWUG has requested that we amend the band plan for 794-806 MHz to allow only fixed, base-to-mobile communications.[230] In this way, the possibility of transmitters operating from multiple and unknown locations is reduced and the problem is confined to fixed stations only.[231] FLEWUG also states that its recommendation reduces the impact of the problem with respect to the equipment modifications required to adhere to the emission limit criteria because slight increases in weight or size in base stations would be manageable while similar changes to handheld devices would be much more apparent and potentially a hindrance to public safety operations.[232] FLEWUG argues that the designation of 794-806 MHz for mobile-to-base communications, rather than for base-to-mobile communications, may exacerbate interference with the GNSS band at 1559-1605 MHz.[233]

72. Several commenters oppose FLEWUG's request because they believe that such redesignation of the band plan would do little to avoid interference with GNSS, and that the traditional emission limits (*i.e.*, 43 + log P) should be sufficient.[234] Florida, APCO, Arizona and Motorola oppose FLEWUG's request because the present band plan offers direct interoperability with existing mobile systems in the adjacent 806-824 MHz band.[235] They also assert that FLEWUG's request would effectively eliminate the ability for mobiles and/or portables to engage in "talk-around" communications between the 700 and 800 MHz bands.[236] Arizona disagrees with FLEWUG and NTIA's recommendation to flip the band plan, noting that it would result in 700 MHz base stations only a few kHz from other 700 MHz base station receivers on primary sites.[237] Motorola states that the potential interference relationship between 700 MHz public safety systems and GNSS is actually quite limited because only a small portion of the public safety mobile allocation (*i.e.*, 779.5-802.5 MHz) has direct second harmonic relations with frequencies

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[228] *Id.* at 168 ¶ 28.

[229] *Id.*

[230] FLEWUG Comments at 20–21 n.46 *citing* FLEWUG Petition for Reconsideration of *First Report and Order* [WT Docket No. 96–86] at 25 ¶ 41 (FLEWUG Petition); *see also* NTIA Comments at 12. FLEWUG raises band flipping in the context of protecting GNSS from interference both in its Petition and in its Comments to the *Third Notice*. *Id.* We discussed GNSS issues primarily in the *Third Notice;* thus, we are considering FLEWUG's "band flipping" recommendation, along with all responsive pleadings, in this *Third Report and Order*.

[231] FLEWUG Comments at 20–21 n.46 *citing* FLEWUG Petition at 25 ¶ 41 (FLEWUG Petition); *see also* NTIA Comments at 12.

[232] *Id.*

[233] *Id.*

[234] *See* Florida Opposition to Petition for Reconsideration at 1; APCO Response to Petition for Reconsideration at 11-12; Arizona Comments at 5; Motorola Comments to Petitions for Reconsideration at 3-4.

[235] *Id.*

[236] Motorola Comments to Petitions for Reconsideration at 3.

[237] Arizona Comments at 5.

assigned to GLONASS.[238] It would therefore be unwise to overlook the benefits of allowing mobile transmitters in the 794-806 MHz band.[239]

73. Motorola alleges that reversing the base and mobile allocations would require the establishment of a guard band of at least one megahertz between the upper edge of the 794-806 MHz base band and the lower edge of the existing 806-824 MHz mobile band.[240] Motorola also notes that establishing such a guard band would further reduce the ability of the 700 MHz allocation to meet the immediate needs of public safety. Additionally, Motorola states that reversing the plan would complicate the design of dual-band mobile receivers by requiring manufacturers to further increase receiver bandwidth in order to accommodate talk-around in the 764-776 MHz band, which would further add to the cost of public safety equipment.[241]

74. After considering all the views, we decline to flip the band plan as suggested by FLEWUG and NTIA. Prohibiting use of the mobile transmitters in the 794-806 MHz base station allocation, as proposed by FLEWUG, would affect the ability of public safety users to communicate unit-to-unit in talk-around mode. Unit-to-unit operations are fundamental to public safety operations and critical to interoperability. As noted by Motorola, reversing the base and mobile allocations may also necessitate the establishment of a 1 MHz guard band at the 806 MHz band edge, further reducing the ability of the 700 MHz allocation to meet the immediate needs of public safety. Moreover, the proposed band plan offers direct interoperability with existing mobile systems in the adjacent 806-824 MHz band. Flipping the band plan would result in the location of 700 MHz base stations with a separation of only a few kHz from other 700 MHz base station receivers on primary sites. We believe that the adopted mobile transmit/receive plan is optimal for public safety users because it provides manufacturers the opportunity to easily broaden the bandwidth of mobile radios to provide interoperability between 700 MHz and 800 MHz band radios. By contrast, reversing the plan would complicate the design of dual-band mobile receivers by requiring manufacturers to further increase receiver bandwidth in order to accommodate talk-around in the 764-776 MHz band and would further add to the cost of public safety equipment.

2. Emission Limits

75. We are faced with dual Congressional obligations on this issue. First, we must "protect the integrity of the [GPS] frequency spectrum against interference and disruption."[242] Additionally, we are also charged with making spectrum available for public safety use in the 746-806 MHz band. Mindful of these obligations, we proposed to adopt the emission limits presented by NTIA but sought comment to create a thorough understanding of the need and ramifications of this standard on use of the 700 MHz band for public safety. Specifically, we must balance the needs of competing requirements of the spectrum. We have considered the comments and conclude that the limits proposed by NTIA provide the appropriate balance between these two obligations. Further, we note the similarity between the issues we confront here and those in the *Commercial 700 MHz R&O* and believe that in the interest of consistency, we should follow the lead previously established with regard to the treatment of GNSS/GPS. Regarding these same issues, we expressed our concern about critical safety-of-life applications of GPS, particularly

[238] Motorola Comments to Petitions for Reconsideration at 4.

[239] *Id.*

[240] *Id.*

[241] *Id.*

[242] Defense FY99 Appropriations Conference Report and in the Commercial Space Act of 1998, H.R. 105-746, Defense FY99 Appropriations Conference Report; H.R. 1702 Commercial Space Act of 1998.

those systems that will use GPS for aeronautical radionavigation, and our desire to ensure that adopted rules do not adversely affect these operations.[243] NTIA, which represents the positions of the Federal Government on spectrum management matters, has suggested specific emission limits for equipment operating in this band that it believes will sufficiently protect aeronautical radionavigation operations. We agree with NTIA that the proposed emission limits will "ensure that fixed and mobile equipment will not cause radio frequency interference to the GNSS when those systems are used for precision approach and landing" and we adopt NTIA's recommendations.[244] Outside of the 1559-1610 MHz radionavigation satellite service (RNSS) band, our traditional standard (*i.e.* generally 43 + 10 log P) will apply.[245]

76. Accordingly, using the rules established in the *Commercial 700 MHz R&O* as a guide, we adopt the following limits: for operations in the 764-776 MHz and 794-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to –70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and –80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.[246] For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

77. In making this determination, we note that the issue at hand is not only the protection of GPS and GLONASS from interference but also the future international GNSS.[247] As to the adequacy of our proposed protection scheme, commenters argued that our proposed standards were either too restrictive or too lenient to protect GNSS operations. Some commenters believe that imposition of the NTIA standards would seriously inhibit the use of these channels by public safety entities.[248] They also believe that the concerns of those supporting stricter standards are overstated. Although many of these commenters endorse the establishment of a special committee of technical experts to further study the issue,[249] we believe the record we sought to expand by way of the *Third Notice* has alleviated any need for such a committee. However, we repeat our view that we might consider longer-term solutions at a future date.[250] Conversely, other commenters adamantly argued that the NTIA limits would devastate GLONASS, result

[243] *Commercial 700 MHz R&O*, 15 FCC Rcd at 504 ¶ 67. We recently reaffirmed these conclusions on reconsideration. *See* Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, WT Docket 99-168, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, FCC 00-224 at ¶¶ 28-29 (rel. June 30, 2000).

[244] NTIA Comments at 1. AirTouch suggests that our proposed emission limits could be difficult to meet for portable units, but does not suggest that they would be so difficult as to prevent equipment manufacturers from producing mobiles and portables meeting those limits. We have not received any indication from any potential 700 MHz band equipment manufacturers commenting in this proceeding that it will be difficult to suppress wideband out of band emission limits to the –70 dBW/MHz level.

[245] *See* 47 C.F.R. § 90.210.

[246] Although we noted in the *First Report and Order* that the current GPS operating at 1563.42-1587.42 MHz would not be impacted by second harmonic emissions from public safety systems operating in 794-806 MHz band (TV Channels 68-69), we clarify that a portion of the public safety band (794-805 MHz) does impact the upper portion of the band used by the GNSS (1559–1610 MHz).

[247] NTIA Comments at 4-5; FLEWUG Reply Comments at 16.

[248] *See, e.g.* NPSTC Comments at 12; Pennsylvania Reply Comments at 12-13.

[249] NPSTC Comments at 14-15; Pennsylvania Reply Comments at 13; PSWN Reply Comments at 11; IACP Comments at 6-7.

[250] *See Third Notice* 14 FCC Rcd. at 244 ¶ 201.

in harmful interference to the GPS frequency band and end the continuous viability of GPS and GLONASS.[251] Still other commenters, such as FLEWUG, generally view NTIA's proposed emission standards, -70 dBW/MHz for wideband emissions and -80 dBW/700 Hz for narrowband emissions, as the most realistic.[252]

78. The current International Civil Aviation Organization (ICAO) standards define GNSS as containing components of both GPS and GLONASS in its final configuration. Many commenters assert that protection for GLONASS is of minimal importance since GPS is the dominant standard in the United States and because only the public safety wideband channels have a direct, though limited, second harmonic relationship with GLONASS.[253] We do not agree with this view. As a member of ICAO and the International Maritime Organization (IMO), the United States has made international commitments to provide protection from interference to GLONASS in its final configuration. These commitments are, in effect, treaty obligations that we must coordinate into a common policy when confronted with interference issues such as the one before us here. Additionally, even though GLONASS has not yet fully develop to achieve extensive practical use, we direct attention to the fact that the use of the 1559-1610 MHz RNSS band is evolving.[254] We, therefore, are adopting rules that provide for the future development of GNSS systems.

79. With regard to aviation concerns, foreign flights are likely to use combined GPS and GLONASS receivers since GNSS consists of both GPS and GLONASS components. We believe that requiring foreign aircraft to use GPS exclusively creates an undue burden and is inconsistent with the treaty obligations of the United States. NTIA notes that GNSS is an international system affecting aviation and marine entities and the United States has international agreements and treaty obligations involving various components of GNSS.[255] Specifically, we must balance the needs of competing requirements of the spectrum. In this case, we must balance the needs of users of GNSS and future users of the 700 MHz band. Contrary to the contentions of many commenters, we cannot discount the effect that emissions may have on GLONASS simply because it is not the favored system used in this country. Rather, the treaty obligations of the United States leave us with little discretion and we must focus on the

[251] The GPS Commenters suggest the following changes to the proposed 47 C.F.R. § 90.553: To provide adequate protection to GNSS receivers which will utilize the Radionavigation-Satellite Service (space-to-Earth) band, mobile units must meet a minimum second harmonic suppression standard in the frequency range of 1559-1605 MHz of 120 dB (was 90) down from the maximum effective radiated power of the carrier and handheld and portable units must meet a minimum second harmonic suppression standard in the frequency range of 1559-1605 MHz of 110 dB (was 80) down from the maximum effective radiated power of the carrier. This proposed standard would apply only to equipment operating in the frequency range of 779.5-802.5 MHz. GPS Commenters at 17.

[252] *See e.g.* FLEWUG Reply Comments at 15-16.

[253] APCO Comments at 9-10; Motorola Comments at 5; Arizona Reply Comments at 5-6; NPSTC Comments at 14.

[254] The current plan of the Russian Federation will result in its highest GLONASS carrier frequency relocating to 1604.8125 MHz. The French Low SATellite NAVigation (LSATNAV) and the ESA E-NSS-1 satellite navigation systems have been proposed for operating in the 1559.052-1563.144 MHz and 1587.696-1592.788 MHz portions of the 1559-1610 MHz band. It is envisioned that one of these RNSS systems will be included in the second generation of GNSS, referred to as GNSS-2. The U.S. is engaged in discussions with the European Union (EU) regarding their Galileo system, a developing RNSS system that is planned to be compatible and interoperable with GPS. The EU is considering spectrum in both the upper and lower portion of the 1559-1610 MHz band for Galileo. The French Administration and the European Space Agency are developing other RNSS systems that may operate in this band as well.

[255] NTIA Comments at 4-7.

effect to GNSS generally because of its dual components, GPS and GLONASS. We conclude that our proposed emission limits will be sufficient to protect critical GNSS operations, *i.e.*, GPS, GLONASS, and the future components of GNSS.

80. Further, we agree with NTIA that the proposed out of band emission limits will ensure that fixed and mobile equipment will not cause radio frequency interference to the GNSS when those systems are used for precision approach and landing. With regard to the separation criteria of 30 meters, as we noted in the *Third Notice*, the limits proposed by NTIA, including its assumption of a separation distance of 30 meters from the GPS or GLONASS receiver for spurious or harmonic signals are consistent with the levels recommended by the FAA.[256] The field data collection of PSWN and comments of FLEWUG support our conclusion that this assumed separation distance is appropriate for public safety operations.[257]

81. The proposed –70 dBW/MHz wideband emission limit is consistent with the United States' position in the ITU-R study group activities. Our decision in this proceeding is also consistent with the decisions adopted on this matter internationally.[258] Should future actions internationally result in conflicts between the decision we adopt here and international positions, we could then consider those differences as part of a separate, future proceeding, if appropriate. To this end, we would encourage continued industry dialogue so that if a consensus based on future data is reached, we can then entertain modifications. Absent more actual data, our decision is based on the recommendations to date.

C. Interoperability Below 512 MHz

82. In the *Third Notice*, we tentatively concluded that locating interoperability channels in the 700 MHz[259] and 800 MHz[260] bands alone would not provide a comprehensive solution to nationwide interoperability.[261] Citing the *PSWAC Final Report*, we noted that federal, state and local public safety agencies use a total of ten radio bands, that range from 30 MHz to over 800 MHz.[262] To date, the ability to operate in these bands with a single, commercial grade radio is complicated because their individual radio systems operate in different frequency bands. Consequently, communications between public safety agencies is limited. This inability to communicate hinders cooperation and coordination among public safety agencies on a day-to-day basis.[263]

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[256] *Third Notice*, 14 FCC Rcd at 241 ¶ 197.

[257] PSWN Comments at 18; FLEWUG Comments at 20-21.

[258] On a related matter, we note that as a result of WRC-2000 there is a new allocation for the radionavigation satellite service in the 1164-1215 MHz band. As part of the GPS modernization program a new GPS signal (L5) for aviation and civil use will be provided in the 1164-1188 MHz portion of the band. RTCA Working Group 6 is currently in the process of examining the protection limits for GPS receivers using the L5 signal.

[259] In the *First Report and Order*, we designated 2.6 megahertz of the 700 MHz band for nationwide interoperability. *Third Notice*, 14 FCC Rcd at 236 ¶ 188.

[260] Five channel pairs in the 821-824/866-869 MHz band (800 MHz band) are available only for mutual aid purposes. *See* 47 C.F.R. § 90.617(a)(1). *See also Report and Order*, General Docket No. 87-112, 3 FCC Rcd 905.

[261] *Third Notice*, 14 FCC Rcd at 236 ¶ 188. "[M]ost public safety radio systems, especially smaller ones, operate in the VHF and UHF bands below 512 MHz. Locating interoperability channels above 512 MHz will not help these [public safety providers])." *Id.*, ¶ 187.

[262] *PSWAC Final Report* at 3.

[263] *First Notice*, 11 FCC Rcd at 12,469.

83. To address these obstacles, we proposed to establish nationwide interoperability channels below 512 MHz, thereby providing for the development and use of shared interoperability systems and the building of gateways between technically incompatible federal, state, and local public safety systems.[264] Accordingly, we made proposals and invited comment on interoperability channels in (1) the existing 150-174 MHz and 450-512 MHz public safety bands, (2) the 138-144 MHz band, and (3) the VHF maritime band at 156-162 MHz. We also sought comment on requiring every public safety mobile radio to have the capacity to transmit and receive on at least one nationwide interoperability channel in the band in which it is operating. Additionally, we requested comment on whether it is necessary to establish a nationwide interoperability band below 512 MHz.[265]

84. Commenters agreed with our conclusion that separate interoperability channels are needed in the Public Safety Pool below 512 MHz.[266] Specifically, commenters supported our proposal in the *Third Notice* to designate specific VHF and UHF channels for interoperability.[267] Moreover, several comments stated that our *Third Notice* proposals did not adequately address the need for interoperability channels below 512 MHz[268] and some commenters also complained about the relatively severe operational limitations that would apply to some of the specific channels that we set forth in the *Third Notice*.[269] While in the *Third Notice* we sought comment on the need for a separate interoperability band below 512 MHz and several commenters continued to promote this solution, no other spectrum identified is readily available.[270] We believe the Rules adopted today represent a practical step toward a comprehensive solution to the issue of interoperability below 512 MHz. As described in detail below, we adopt specific channels within the existing public safety bands (150-174 MHz and 450-512 MHz) resulting from the *Refarming* proceeding for nationwide interoperability. We also designate the three VHF channel pairs set-aside for public safety in the VHF maritime band (156-162 MHz), which are located generally in the Midwest region of the country, for interoperability use. For convenience, the following table sets forth the specific channels below 512 MHz that we are designating exclusively for interoperability purposes.

[264] *PSWAC Final Report* at 3; *First Notice*, 11 FCC Rcd at 12,472.

[265] *Third Notice*, 14 FCC Rcd at 237-38 ¶ 191.

[266] *See e.g.*, FLEWUG Comments at 18-19; Florida Comments at 7-8; Motorola Comments at 8; APCO Comments at 7.

[267] *See e.g.*, IACP Comments at 4; Florida Comments at 6; Cities Comments at 17; NYSTEC Comments at 12-13.

[268] APCO Comments at 7-8; FLEWUG Comments at 19 citing *PSWAC Final Report* at 21; PSWN Comments at 16-17; PSWN Reply Comments at 10; NYSTEC Comments at 13; State of California Comments at 8.

[269] Motorola Comments at 8-9; NPSTC Comments at 8.

[270] *First Report*, 14 FCC Rcd at 238-239 ¶193 citing *PSWAC Final Report* at 52.

Table of Public Safety Interoperability Channels Below 512 MHz[271]

CHANNEL (MHz)	LABEL	NOTES
151.1375 base/mobile	VTAC 1	not available in PR/VI
154.4525 base/mobile	VTAC 2	not available in PR/VI
155.7525 base/mobile	VCALL	
158.7375 base/mobile	VTAC 3	
159.4725 base/mobile	VTAC 4	
157.250 mobile 161.850 base/mobile	RTAC 1 RTAC 1a	VPC Ch. 25 (25 kHz pair) Available in all 33 EAs
157.225 mobile 161.825 base/mobile	RTAC 2 RTAC 2a	VPC Ch. 84 (25 kHz pair) Available in 22 EAs
157.275 mobile 161.875 base/mobile	RTAC 3 RTAC 3a	VPC Ch. 85 (25 kHz pair) Available in 11 EAs
453.2125 base/mobile 458.2125 mobile	UCALLa UCALL	
453.4625 base/mobile 458.4625 mobile	UTAC 1a UTAC 1	
453.7125 base/mobile 458.7125 mobile	UTAC 2a UTAC 2	
453.8625 base/mobile 458.8625 mobile	UTAC 3a UTAC 3	

1. Interoperability Channels in the 150-174 & 450-512 MHz (Existing Public Safety Bands).

85. In the *Third Notice*, we proposed to designate ten channels in the existing public safety bands below 512 MHz for nationwide interoperability. Several commenters supported this proposal, but voiced concerns about adjacent channel assignments and bandwidth problems.[272] NPSTC and Arizona noted that other VHF and UHF spectrum could be reallocated nationwide, including the wideband paired channels in the 150-160 and 450-460 MHz bands (Improved Mobile Telephone Service which is now obsolete due to cellular and PCS).[273] APCO, Motorola and others note that the specific UHF channels identified in *the Third Notice* are 6.25 kHz wide channels which is inconsistent with the PSWAC recommendation of 12.5 kHz for interoperability channels.[274]

86. Upon review of the comments, we adopt five VHF channels (five frequencies) and four UHF channel pairs (eight frequencies) for interoperability purposes — one calling channel and four tactical channels in the existing VHF public safety band at 150-174 MHz, and one calling and three tactical

[271] We note that NTIA has designated certain federally allocated radio frequencies for interoperability use under a plan it developed in cooperation with IRAC and FLEWUG. *See* National Telecommunications and Information Administration (NTIA), U.S. Department of Commerce, *Manual of Regulations and Procedures for Federal Radio Frequency Management* (January 2000 Edition) § 4.3.16.

[272] NPSTC Comments at 7-8; IACP Comments at 4; Arizona; Motorola Comments at 7.

[273] NPSTC Comments at 10 *citing* Letter comments from DOD to PSWAC, dated July 29, 1996, and incorporated as Appendix K to the Spectrum requirements Report, *PSWAC Final Report* Appendix D at 119 (725); Arizona Reply Comments at 8.

[274] *See e.g.*, APCO Comments at 8, Motorola Comments at 7, NYSTEC Comments at 13.

channel pairs in the existing UHF public safety band at 450-512 MHz.[275] Although some commenters indicated that we should look elsewhere (*e.g.*, Part 22, Improved Mobile Telephone Service) for interoperability channels, the record before us is insufficient to justify reallocating spectrum already allocated to other services. Moreover, we believe that designating channels in the existing public safety bands for interoperability is a practical and necessary step in addressing the lack of interoperability considering that a substantial number of federal, state, and local public safety agencies operate in these bands. While we acknowledge the difficulties associated with adjacent channel operations, which are discussed below, the advent of 12.5 kHz "offset" channels resulting from the *Refarming* proceeding presents a significant opportunity to designate channels for nationwide interoperability purposes that we should not overlook. We realize our decisions may adversely impact existing licensees, however we believe that the benefits of providing for interoperability in these bands outweigh any adverse impact. We believe our action facilitates additional interoperability capability with minimal impact to existing licensees. Moreover, we received no comments opposing our proposal to designate interoperability channels in the public safety bands below 512 MHz.

87. As an initial matter, we adopt the five VHF channels 151.1375, 154.4525, 155.7525, 158.7375, and 159.4725 MHz as set forth in the *Third Notice*. These channels were recommended by the frequency coordinators and generally supported by commenters.[276] Nevertheless, their use as interoperability channels presents serious operational challenges. As noted by several commenters, VHF channels are spaced 7.5 kHz apart but operations are permitted up to 12.5 kHz, and this overlap increases the potential for adjacent channel interference. Generally, this adjacent channel interference is minimized through prudent sharing of these channels during frequency coordination, *e.g.*, attempting to keep adjacent-channel VHF transmitters separated by ten miles. However, such coordination is not possible on nationwide interoperability channels, which by definition cannot be restricted geographically or operationally. Thus, adjacent channel interference will be a serious operational challenge for VHF interoperability channels. Nonetheless, the need for additional interoperability capability in the VHF band outweighs these operational challenges – some VHF interoperability capability is better than no VHF interoperability capability. Since this is a characteristic of the VHF band and no alternate channels were suggested in comments, we conclude that these channels represent a viable choice based on industry views.

88. For the UHF band, we adopt four channel pairs for interoperability purposes: 453/458.2125, 453/458.4625, 453/458.7125, and 453/458.8625 MHz. In the *Third Notice*, we proposed two UHF channel pairs (four frequencies) and sought comments on another channel pair for nationwide interoperability purposes.[277] Although several commenters supported designating UHF channels for interoperability, they also noted that the specific channels identified in the *Third Notice* for interoperability are 6.25 kHz wide channels which would be inconsistent with the PSWAC recommendation of 12.5 kHz for interoperability channels.[278] We agree.[279] Relying on our experience with the five channel pairs designated at 800 MHz for interoperability, we believe four channel pairs are

[275] Frequencies in the 450-512 MHz band are paired channels, necessitating adoption of an even number of channels (four or six) rather than five.

[276] While noting limitations, several commenters supported the designation of five VHF channels for interoperability. None suggest alternative channels. *See e.g.*, APCO Comments at 8, IACP Comments at 4, Florida Comments at 6, Cities Comments at 17, FLEWUG Comments at 19.

[277] *Third Notice*, 14 FCC Rcd at 237-38 ¶191.

[278] NPSTC Comments at 7-8; IACP Comments at 4; Arizona; Motorola Comments at 7.

[279] *See NCC Report* at 21, 22 ¶¶ 68, 69.

an appropriate number to facilitate interoperability in the UHF band.[280] Based on a search of our database the channels we adopt today represent the least encumbered 12.5 kHz UHF channels.[281] Currently, there is a freeze on the licensing of new high power stations on the 12.5 kHz "offset" channels in the 450–470 MHz band[282] but the freeze on the filing of these applications in the 450-460 MHz band is to be lifted on January 29, 2001.[283]

89. Because our decision affects not only those licensed on the interoperability frequencies but also those on nearby channels operating with 12.5 kHz or 25 kHz equipment, we will provide a transition period through January 1, 2005 for implementation.[284] Current licensees may continue to operate on these interoperability channels indefinitely; however, after January 1, 2005, existing users that continue to operate on these channels will do so on a secondary basis to interoperability uses.[285] Prior to January 1, 2005, interoperability use will be permitted only on a secondary basis to existing users; that is, interoperability transmissions can be made only when the channel is clear and on a non-interference basis. This transition period, we believe, will provide existing licensees with sufficient time and notice to become aware of any potential effects on their particular operations by future interoperability use. It also provides any critical public safety operations with ample time to identify their options and determine the best course of action. We also note that some public safety operations may be such that they could be suspended during emergency situations. Specifically, an existing licensee could assign noncritical traffic to the interoperability channel and instruct its employees to use other VHF channels whenever the

[280] Based on our experience with the five channel pairs designated at 800 MHz for interoperability, four represents the appropriate number of interoperability channels in the UHF band where channels also are paired. Given that one pair is reserved as a calling channel, fewer than four channel pairs would provide too few tactical channels and greater than four would have even a greater impact to existing licensees.

[281] These "least licensed" channels are 12.5 kHz "offset" channels chosen from the PX coordinator pool (former local government radio service) because the PX pool has the largest number of channels pairs (75 pairs) and applications can be coordinated by all four coordinators. By comparison, the PP coordinator pool (former police radio service) has 41 pairs, the PM coordinator pool (former emergency medical radio service) has 24 pairs, the PF coordinator pool (former fire radio service) has 6 pairs, the PS coordinator pool (former special emergency radio service) has 1 pair, and PP/PF/PM jointly share 4 pairs. Choosing channels in the PX coordinator pool also should minimize the impact to the majority of existing police, fire, and emergency medical licenses which were located in their respective pools. Each "offset" channel that we select for interoperability has a potential impact on between 32-78 incumbent (primary), co-channel licensees. As a factual matter, between 2376-2506 adjacent channel licensees are also impacted. We selected channels that are spaced 250 kHz apart since no "offset" channel appears to be significantly better than another simply by numbers counted, because the 250 kHz separation between channels presents a technically sound solution (*e.g.*, permits antenna combining and minimizes intermodulation interference) for these four channels. *See* paras. 29, 30, *supra*.

[282] *See* Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them, PR Docket No. 92–235, *Second Memorandum Opinion and Order*, 14 FCC Rcd 8642, 8660 ¶ 33 (1999) citing Freeze on the Filing of High Power Applications for 12.5 kHz Offset Channels in the 450-470 MHz Band, *Public Notice*, 10 FCC Rcd 9995 (1995).

[283] *See* Freeze on the Filing of High Power Applications for 12.5 kHz Offset Channels in the 450-460 MHz Band to be Lifted January 29, 2001, *Public Notice*, DA 00-1360 (June 29, 2000). *See also* Wireless Telecommunications Bureau Accepts LMCC Low Power Plan for Part 90 450-470 MHz Band, *Public Notice*, DA 00-1359 (June 29, 2000).

[284] The January 1, 2005, date corresponds to the required date by which the new equipment in the VHF and UHF bands must meet the new 6.25 kHz standards. *See* 47 C.F.R. § 90.203 (j); *see* also *Refarming First R&O*, 10 FCC Rcd at 10,099 ¶ 38.

[285] Secondary operations may not cause interference to primary interoperability use.

interoperability channel is needed for interoperability communication. Or, an existing licensee may anticipate that it would be a part of any interoperability event within its jurisdiction (licensed area), in which case it would use the interoperability channel only for interoperability communication for the duration of the interoperability event or need. We believe the adoption of interoperability channels in these critical public safety bands – where the majority of public safety radio systems operate today – will make significant interoperability improvements.

90. Under our Rules, an entity must have a license to operate a base or control station on these interoperability channels.[286] Mobile operation, however, is permitted on these channels without an individual license (*i.e.*, a blanket licensing approach).[287] Public safety licensees who are eligible to hold a Part 90 license, or who are otherwise licensed under Part 90 of our Rules, can operate mobile units on these interoperability channels without an individual license. Additionally, as suggested in comments, we also will require, as of January 1, 2005, every newly certified public safety mobile radio unit to have the capacity to transmit and receive on at least one nationwide interoperability channel (*i.e.*, the calling channel) in the band in which it is operating.[288] For licensing and administration of these interoperability channels, we will rely on the four public safety frequency coordinators.[289] We envision that the four coordinators would jointly develop an interoperability plan regarding the management and nationwide use of these interoperability channels. This plan could be developed in concert with the group(s) tasked with administering the interoperability channels in the 700 MHz band. Additionally, we would expect the frequency coordinators to work with existing licensees experiencing harmful interference to critical public safety operations to find suitable replacement channels.[290] Finally, until general interoperability provisions can be made with Canada and Mexico, interoperability operations within the Canadian and Mexican border areas will need to be coordinated on an individual basis with these countries in the usual manner.

2. Interoperability Channels in the 138-144 MHz Band (NTIA/DOD Reallocation)

91. We also noted in the *Third Notice* that NTIA identified three megahertz of 138-144 MHz band to reallocate and auction as new telecommunications services by 2008 as required by the Balanced Budget Act of 1997.[291] In response to the suggestion of the *PSWAC Final Report*, we sought comment on

[286] As with the 800 MHz National Public Safety Planning Advisory Council (NPSPAC) mutual aid channels, base and control stations must be licensed individually. *See 800 MHz Band Report and Order*, 3 FCC Rcd at 909 ¶¶ 30, 33-34; *see generally* 47 C.F.R. §§ 90.16, 90.20, 90.603, 90.617, 90.619(a)(2).

[287] *See 800 MHz Band Report and Order*, 3 FCC Rcd at 909 ¶¶ 30, 33-34; *see generally* 47 C.F.R. §§ 90.16, 90.20, 90.603, 90.617, 90.619(a)(2).

[288] FLEWUG Comments at 19; NYSTEC Comments at 14.

[289] With an exception not relevant here, there are currently four frequency coordinators certified to coordinate frequencies for public safety applicants; Association of Public–Safety Communications Officials–International (APCO), International Association of Fire Chiefs, Inc. (IAFC)/International Municipal Signal Association (IMSA), Forestry Conservation Communications Association (FCCA), and American Association of State Highway and Transportation Officials (AASHTO). *See, e.g.*, Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them, PR Docket No. 92–235, *Second Report and Order*, 12 FCC Rcd 14307 (1997) at App. D (List of Frequency Coordinators Below 512 MHz).

[290] We additionally note that the existing licensee could migrate to frequencies in the 700 or 800 MHz bands, or be offered alternative channels in the VHF/UHF bands as other licensees relocate to these higher bands.

[291] *Third Notice,* 14 FCC Rcd at 238-239 ¶ 193, citing *PSWAC Final Report* at 52.

the feasibility of using the 138-144 MHz band currently used by the U.S. Department of Defense and the Federal Emergency Management Agency as a separate interoperability band.[292] However, in the "National Defense Authorization Act of FY 2000," Congress reclaimed this spectrum for exclusive federal use, thus rendering the issue moot.[293]

3. Interoperability in 156-162 MHz Band (VHF Maritime Band)

92. In the *Maritime Third Report and Order,*[294] we designated exclusively for public safety users two 25 kHz channel pairs (either Channels 25 and 84, or Channels 25 and 85) in the VHF 156-162 MHz maritime band in each of the thirty-three inland VHF Public Coast areas (VPCs).[295] We set aside Channel 25 (157.250/161.850 MHz) for public safety in each of these areas. However, because of incumbent licensees (whose operations were grandfathered and continue to be protected), no other single channel was available in all thirty-three areas.[296] Therefore, we set aside Channel 84 (157.225/161.825 MHz) in twenty-two of the areas and Channel 85 (157.275/161.875 MHz) in the other eleven areas.[297] We then stated in the *Maritime Third Report and Order* that the ultimate use for these reserved frequencies, and the procedures for licensing this spectrum, would be decided as part of the public safety proceeding.[298]

93. In the *Third Notice*, we proposed to designate these channels for interoperability operations in each of the thirty-three VPCs.[299] We also proposed to require public safety licensees to use these channels in accordance with the rules, standards and procedures formerly found in section 90.283 of our rules and be subject to coordination of these stations with Canada and Mexico in the same manner as public coast stations.[300] Commenters support the proposal, but note that while the reallocation will provide significant relief to some areas of the country, it will provide only limited relief to the basic interoperability needs facing public safety radio systems.[301] They further state that the proposal has extreme geographic restrictions and does not meet one of the primary requirements for interoperability spectrum described in

[292] *Third Notice*, 14 FCC Rcd at 239 ¶ 193. *See also Petition of the National Public Safety Telecommunications Council for Further Rulemaking to Allocate Spectrum in the 138-144 MHz Band for Public Safety* (April 9, 1998).

[293] *See* Pub. L. No. 106-65, § 1062, 113 Stat. 767 (1999).

[294] *See* Amendment of the Commission's Rules Concerning Maritime Communications, *Third Report and Order and Memorandum Opinion and Order,* PR Docket No. 92-257, 13 FCC Rcd 19853, 19853, 19895-19900 (Appendix C, D and E) (1998) (*Maritime Third Report and Order*).

[295] A VPC constitutes a separate licensing area and is an inland Economic Area, no part of which is within one hundred miles of a major waterway. *See Maritime Third Report and Order* at 19862 ¶ 15.

[296] *Maritime Third Report and Order*, 13 FCC Rcd at 19863-64 ¶ 18.

[297] *Maritime Third Report and Order*, 13 FCC Rcd at 19899 Appendix E. We note that the Maritime Communications proceeding, PR Docket No. 92-257, remains pending and that there may be additional opportunities to facilitate public safety use of maritime channels to meet interoperability or other needs.

[298] *Maritime Third Report and Order*, 13 FCC Rcd at 19868-69 ¶ 31.

[299] *Third Notice*, 14 FCC Rcd at 240 ¶ 194.

[300] *Id.*

[301] APCO Comments at 9; NPSTC Comments at 9-10; IAPC Comments at 5.

the PSWAC Report. NPSTC therefore believes these individual areas may benefit more by licensing these channels for operational rather than interoperability use.[302]

94. We adopt the proposal to designate these frequencies for interoperability in the thirty-three inland EAs.[303] We agree that this action is not a comprehensive, nationwide solution to the interoperability needs facing the public safety community,[304] it nonetheless helps to alleviate some of the need for interoperability capabilities. The channel pairs (channels 25, 84, and 85) will consist of 25 kHz channel pairs and will be available exclusively for assignment to public safety entities but only in the thirty-three EAs listed in our Rules. We are designating these channels as primarily for interoperability purposes, which means that interoperability communication has primary status over noninteroperability communication, which is permissible when the channels are not needed for interoperability use.

95. Applicants will apply for channel pairs (depending on which permissible EA is involved) in accordance with all relevant technical provisions under Part 90 of our Rules. We also sought comments on the appropriate power limit for these channels.[305] One of our concerns is that VHF public safety channels are usually allowed to have maximum effective radiated power of 500 watts under Part 90 of our Rules. Pursuant to former Section 90.283 of our Rules, however, the public coast channels as well as those that shared these channels under Part 90 were limited to a transmitter power of 50 watts.[306] No comments addressed this point. Ideally, we would prefer to allow the public safety stations to use the same facilities and standards that we adopted for the 700 MHz band and other Part 90 land mobile systems. The public coast stations, which utilize these channels, however, are limited to a transmitter output of 50 watts.[307] Consequently, we will limit the public safety users to a transmitter output power of 50 watts. This limitation will ensure proper protection to grandfathered stations as well as public coast stations in adjoining regions.

VI. PROCEDURAL MATTERS

96. To better understand the nature of the Y2K problem and the potential risks it posed to public safety communications networks, we sought comment in the *Third Notice* on how best to ascertain the extent, reach, and effectiveness of Y2K compliance initiatives undertaken by public safety entities. We requested information on at least three possible means to accomplish this goal and made no specific proposals. Nine comments and three reply comments addressing Y2K matters were filed in response to the *Third Notice*. In October 1999, in conjunction with the Network Reliability and Interoperability Council ("NRIC"), the Commission and NRIC released its Y2K Communications Sector Report Supplements for Broadcast, Cable, Satellite, and Emergency Communications. We incorporated the information provided in response to our request for information in the *Third Notice* into this supplement. Accordingly, we are incorporating the supplement into the record of WT Docket No. 96-86 and including a summary of the Y2K comments filed in response to the *Third Notice* as Appendix E.

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[302] NPSTC Comments at 9-10 citing *PSWAC Final Report*, Appendix C – Interoperability Subcommittee Report, Section 12.3.11.4, page 152 (426) and Section 12.3.11.5, page 153 (427); *see also* IACP Comments at 5.

[303] A map of the inland VPCs is attached as Appendix H.

[304] APCO Comments at 9; IACP Comments at 5; NPSTC Comments at 9-10.

[305] *See* 47 C.F.R. § 90.205.

[306] *See* former 47 C.F.R. § 90.283(c) (1997) (limiting transmitter power of Part 90 users sharing VHF public coast spectrum to 50 watts), (removed by the *Maritime Third Report and Order* at Appendix F).

[307] 47 C.F.R. § 80.215(c)(1).

97. *Ex Parte Presentations*. The captioned proceeding is a permit-but-disclose notice and comment rule making proceeding. *Ex parte* presentations are permitted, provided they are disclosed as provided in Commission Rules.[308]

98. *Paperwork Reduction Analysis*. This *Third Report and Order* contains modified information collections, respectively. As part of its continuing effort to reduce paperwork burdens, the Commission invites the general public and the Office of Management and Budget (OMB) to take this opportunity to comment on revision to the information collections contained in the *Third Report and Order*. As required by the Paperwork Reduction Act of 1995, Pub. L. No. 104-13, public comments on the information collections contained in the *Third Report and Order* are due thirty days after publication of the summary of the *Third Report and Order* in the Federal Register.

99. Comments on the modified information collections contained in the *Third Report and Order* should address: (a) whether the collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology. These comments should be submitted to Judy Boley, Federal Communications Commission, Room 1-C804, 445 12th Street, S.W., Washington, D.C. 20554, or via the Internet to jboley@fcc.gov. Furthermore, a copy of any such comments should be submitted to Virginia Huth, OMB Desk Officer, 10236 NEOB, 725 17th Street, N.W., Washington, D.C. 20503.

Final Regulatory Flexibility Act Analysis

100. As required by the Regulatory Flexibility Act, *see* 5 U.S.C. § 604, the Commission has prepared a Third Supplemental Final Regulatory Flexibility Analysis of the possible impact of the rule changes contained in the *Third Memorandum Opinion and Order* on small entities. The Third Supplemental Final Regulatory Flexibility Analysis is set forth in Appendix A. As required by the Regulatory Flexibility Act, *see* 5 U.S.C. § 604, the Commission has prepared a Final Regulatory Flexibility Analysis of the possible impact of the rule changes contained in the *Third Report and Order* on small entities. The Final Regulatory Flexibility Analysis is set forth in Appendix B. The Commission's Consumer Information Bureau, Reference Information Center, will send a copy of this *Third MO&O and Third Report and Order*, including the Third Supplemental Final Regulatory Flexibility Analysis and the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

VII. ORDERING CLAUSES

101. Authority for issuance of this *Third Memorandum Opinion and Order and Third Report and Order* is contained in Sections 4(i), 302, 303(f) and (r), 332, and 337 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302, 303(f) and (r), 332, 337.

102. Accordingly, IT IS ORDERED pursuant to 4(i), 302, 303(f) and (r), 332, and 337 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302, 303(f) and (r), 332, 337 that Part 90 of the Commission's Rules, 47 C.F.R. Part 90, IS AMENDED as set forth in Appendix F, effective thirty days after publication of this *Third Memorandum Opinion and Order* and *Third Report and Order* in the Federal Register.

[308] *See generally* 47 C.F.R. §§ 1.1202, 1.1203, 1.1206.

103. IT IS FURTHER ORDERED that the Commission's Consumer Information Bureau, Reference Information Center, SHALL SEND a copy of this *Third Memorandum Opinion and Order and Third Report and Order,* including the Supplemental Final and Final Regulatory Flexibility Analyses, to the Chief Counsel for Advocacy of the Small Business Administration. For further information, contact Peter J. Daronco, Wireless Telecommunications Bureau, Public Safety and Private Wireless Division, Policy and Rules Branch at (202) 418-0680.

FEDERAL COMMUNICATIONS COMMISSION

Magalie Roman Salas
Secretary